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A Review of the Species of TANARTHROPSIS Casey.

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The genus *Tanarthrus* was established in 1851, by Dr. J. L. LeConte, upon *T. salinus*, an Anthicid from the salt basins of the Colorado desert. Its peculiar habits were alluded to at the time of description, the flight being likened to that of *Bembidium*, though in his later "Synopsis of the Anthicites," Dr. LeConte says "it runs very actively and frequently takes flight like *Cicindela* or *Bembidium*." Next year, another insect, *Anthicus alutaceus* Lec., was removed to the genus, and in 1875 *T. salicola* was described by the same author. Thus the matter stood until 1895, when Major Casey revised the Anthicidæ. He proposed the subdivision of the genus, using the name *Tanarthrus* (in subgeneric sense) for *salinus* alone, creating the subgenus *Tanarthropsis* for the smaller forms, *alutaceus*, *salicola* and four others which he proceeds to describe. Recently, by letter, he has suggested that *Tanarthropsis* be raised to generic rank, on the basis of the antennal structures elaborated in his Revision referred to above—and in deference to his opinion I have here adopted that view.

All of the species of *Tanarthropsis* are small, seldom exceeding a length of 3 mm. In build they are very similar, all rather narrow, more or less depressed, the elytra generally subtruncate, exposing the pygidium wholly or in part. The coloration is simple, the body being usually rufous or testaceous, the abdomen and postpectoral regions frequently blackish, the elytra pale, more or less yellowish, with a post-median dark band, which may be expanded along the sides. In a few instances the dark color of the elytra predominates, while *T. alutaceus* is wholly blackish. The peculiar elytral sculpture has been well described by Major Casey. On these parts of the body, the surface is finely reticulate and minutely densely punctate, and frequently, in addition, we find a set of larger craterform or areolate punctures, scattered among the smaller ones, better developed in some species than in others, and giving the insect a striking appearance under sufficient magnification. Upon this sculpture, Major Casey divided the species of *Tanarthropsis* into two series, using the presence or absence of these craterform punctures

as a point of departure in the construction of his table. But, unlikely as it may seem at first sight, I believe, from the study of a very large series, that the character is principally sexual, the crater-form punctuation pertaining especially (though not exclusively) to the males. Further reference will be made to this feature in the specific descriptions.

Some of the species of *Tanarthropsis* are quite closely allied among themselves. They are occasionally common in the Great Basin, some extending into Arizona and to the sea coast of California, but not, so far as known, reaching Mexico. Their habits are quite similar, most of the species frequenting the flats in the immediate vicinity of salt or alkaline lakes, hiding under rubbish or caked mud, running and flying, when disturbed, after the manner of *Bembidium*. Nearly all have come under my personal observation in the field. Their distribution is correlated in a striking manner with that of the *Cicindelæ* of the *latesignata*, *fulgida* and *echo* types—a matter to which I shall revert later on.

I wish to express my thanks to those who have assisted in the preparation of this little memoir. I have derived much help from the advice of Major Casey, who verified my determinations of some of his species and gave me information concerning the LeConte types which he has examined. Through the kindness of Mr. Schwarz and Dr. Howard I have been enabled to study the National Museum series, and Dr. Holland has favored me with some specimens from the Ulke collection (now in the Carnegie Museum) for comparison. Mr. Fall has loaned me a series from his cabinet and has verified certain characters to which I had called his attention. My own collections have provided me with a series running into the hundreds, and I think the material at my disposal far exceeds that in the hands of previous investigators.

My proposed tabular arrangement of the species of the genus *Tanarthropsis* is based largely upon color characters, because these are easily seen and fairly constant. The disposition of the pubescence upon the elytra has proved a useful feature as a point of departure, and is readily observable with the help of a strong hand lens. I have not felt at liberty to make much use of the extent to which the pygidium is exposed, finding that the abdomen is apparently susceptible to a varying degree of contraction in drying. With a fair series at hand, some study and a good microscope, it is proba-

ble that the separation of the species will be a matter of only moderate difficulty. Reference should, however, be had to the descriptions as well as to the table, which follows:

- A. Elytral pubescence, in a short post-scutellar space, directed sharply away from the suture. Apical truncature strong.
brevipennis Csy.
- AA. Elytral pubescence directed backwards over the entire disk.
- b. Elytra more or less flavate or rufescent.
- c. Elytra connate along the suture, not dehiscent at apex. . . . **nubifer** Csy.
- cc. Elytra not connate, dehiscent apically.
- d. Elytra (in the male) covering the entire abdomen, not in the least truncate. Sides of prothorax strongly shining beneath.
virginalis n. sp.
- dd. Elytra more or less truncate, exposing at least the tip of abdomen.
- e. Head and prothorax black or nearly so. **mormon** n. sp.
- ee. Head and prothorax rufous or testaceous.
- f. Elytra normally blackish, pale only at base; a small subapical spot sometimes present on each. **inyo** n. sp.
- ff. Elytra in greater part pale, often with blackish postmedian band.
- g. Elytra distinctly though not very strongly shining; the blackish fascia simply transverse. **salicola** Lec.
- gg. Elytra densely opaque, apparently thicker; blackish fascia extending along the sides to apex. **densus** Csy.
- ggg. Elytra without postmedian blackish fascia. **infernalis** n. sp.
- bb. Elytra and entire body black. **alutaceus** Lec.

T. brevipennis Casey.—Narrow, subparallel, depressed, not shining, pale rufotestaceous, under side of abdomen piceous, exposed dorsum blackish, elytra blackish, with the apex and about basal third pale. Pubescence distinct, pale, flaring away from the suture in the postscutellar region. Head quadrate, basal impression obsolete, tempora subparallel, long, arcuate, slightly more prominent than the small eyes; disk reticulate, punctures large and shallow. Prothorax narrower than the head, reticulate and with shallow punctures; widest near the apex, where it is strongly rounded, sides thence oblique and feebly arcuate, slightly sinuate to the basal margin. Elytra short, wider behind the middle and at apex than at base, sides feebly arcuate, disk flattened, minutely densely punctured in the female. Legs rather short and somewhat stout, the tarsi short and very slender. Length 3 mm.

In general, the above brief description follows that of Major Casey, which may be consulted for further detail. He described the species from a female, given him by Mr. Roberts and originally collected by myself at Holbrook, Arizona. In my collection is a precisely similar female from the same place, and I have placed another in the collection of the National Museum. A male from Winslow, Arizona, in my collection, is associated with this species, but differs

in having the craterform punctures of the elytra strongly developed and rather crowded. In this sex, the fifth ventral is as long as the fourth, broadly depressed posteriorly at middle, the apex finely beaded with shallow but broad emargination.

Readily distinguishable in both sexes, from all our other species of *Tanarthropsis* by the peculiar disposition of the pubescence in the postscutellar region. In the Ulke collection, now in the Carnegie Museum, this species is labelled *salinus* Lec., with which it agrees in no essential particulars.

There is no salt or alkaline lake in the neighborhood of Holbrook and Winslow, where I collected the species in moderate numbers. While I have no field notes bearing directly on the matter, my belief is that the beetles were found hiding under drying cowdung along the river bars.

T. nubifer Casey.—Narrow, parallel, depressed, dull, elytra paler, less dull; pale rufotestaceous, abdomen above and beneath blackish. Elytra with a common scutellar spot and another on each behind the middle, blackish. Pubescence short, decumbent, rather close, even, longitudinal in direction on the elytra. Elytra short, one-half longer than wide, connate throughout, the sides parallel, not wider behind the middle than at base, punctures fine and dense, craterform punctures wanting. Length 3 mm.

I have not seen this species, which should easily be recognized by the shorter, connate, parallel elytra. It is described from Great Salt Lake, the female only being known. A specimen of *Tanarthropsis* in my collection from Honey Lake, California, has short, apparently connate non-dehiscent elytra, but they are distinctly broader behind the middle and the craterform punctuation is distinct. I prefer not to give it a name at present.

T. virginalis n. sp.—Narrow, less depressed than usual, faintly shining, rufotestaceous, the elytra paler, very slightly infuscate at base and with faint indication of marginal postmedian cloud, abdominal segments blackish beneath. Pubescence rather short, pale, subdecumbent, not close on the elytra. Head subquadrate, base truncate, tempora moderately long, nearly parallel but slightly arcuate and a little less prominent than the eyes, median basal impression obsolete, almost wanting; sculpture consisting of a distinct intricate reticulation surrounding well-defined subareolate shallow punctures, which are regularly disposed and separated usually by considerably less than their own diameters. Constriction of the eleventh antennal joint much less marked than usual. Prothorax of the usual shape, slightly narrower than the head, sculpture similar to that of the head but distinctly deeper, the punctures distinctly areolate, basal margin and collar well defined and strong. Elytra broader than the prothorax, pubescence directed longitudinally, craterform punctures distinct, separated on

the disk by spaces usually equal to or greater than their diameters; apices not in the least truncate. Abdomen finely distinctly reticulate, sparsely punctate and pubescent. Length 2.6 mm.

The elytra are somewhat spread in the unique male type, but evidently quite cover the abdomen; the wings are seen to be large and well developed. The fifth abdominal segment is broadly but distinctly emarginate, the posterior margin finely beaded. The flanks of the prothorax beneath are apparently brilliantly polished under low power, though under high magnification they are seen to be finely reticulate, with a few distant, regularly disposed, pubiferous simple punctures. The type remains in my cabinet. I took it on the flats adjoining the Virgin River, a few miles from St. George, Utah, in July. A close search failed to disclose any other specimens of the genus in the neighborhood.

T. mormon n. sp.—Smaller and less depressed than usual, parallel, opaque, blackish piceous, pubescent, antennæ and legs reddish brown, elytra with large basal and subapical pale spot on each. Head subquadrate, truncate and broadly emarginate at base, tempora very slightly divergent posteriorly, faintly arcuate, about as prominent as the eyes; upper surface distinctly strongly but finely reticulate, variolate punctures shallow but numerous, mostly separated by a distance much less than their own diameters, basal median impression distinct but not deep. Prothorax of the usual form, slightly narrower than the head and similarly but more deeply punctured, collar and basal marginal bead strong. Elytra conjointly broader than the prothorax, not covering the abdomen, subparallel, not connate, apices distinctly subtruncate and dehiscent. Punctuation double, as usual, craterform punctures not very well differentiated in either sex, though more so in the male, where they are close, almost approximate. Pubescence short, sparse, longitudinally directed. Abdomen alutaceous, sparsely punctured and pubescent. Legs moderate. Length 2.55 mm.

The type is a female, collected by myself on the flats near Utah Lake, in the vicinity of Provo, during June. With it are associated two males from the same source. In the latter sex, the fifth ventral is feebly broadly emarginate behind, as usual. Some variation is exhibited in the series, the depth of color not being uniform. In one specimen, the elytra are entirely dark, except a small subhumeral and apical pale spot on each. The type remains in my collection, a cotype has been placed in the U. S. Nat. Mus.

T. inyo n. sp.—Subparallel, rather depressed, slightly shining, head and prothorax rufo-testaceous, legs and antennæ paler, the elytra, excepting an indefinite reddish basal space and occasionally a subapical spot, blackish. Abdomen and metasternum also blackish. Pubescence whitish, sparse, less so on the elytra, where it is seen to be of two lengths intermixed. Head subquadrate,

finely reticulate, and with scattered moderately deep variolate punctures, tempora subparallel, a little less prominent than the eyes, angles broadly rounded, base truncate and sinuate, median impressed line short but distinct. Antennæ rather long, feebly incrassate, second and third joints subequal, a little longer than those immediately succeeding, fourth to seventh maintaining nearly uniform size and shape, eighth to tenth proportionately broader and more constricted at base, eleventh acorn shaped, nearly equal in length to the two preceding, constricted as usual, the basal portion shorter. Prothorax barely wider than long, widest and strongly rounded at apical third, sides behind rapidly arcuately narrowing to about basal third, parallel only very near the base. Basal marginal line distinct; disk more coarsely and deeply punctured than the head. Elytra near the base a little more than one-third wider than the prothorax, sides subparallel, slightly broader behind the middle, thence again narrowing, tips dehiscent, subtruncate, angles rounded, the outer much more broadly, disk reticulate, craterform punctures well developed in the males, irregularly and not very closely disposed at middle but closer near the base and apex, pubescence directed longitudinally. Abdomen beneath, finely and distinctly reticulate, but shining, sparsely punctured and pubescent. Length 2.8-3.5 mm.

The fifth ventral of the male is truncate behind, broadly, not deeply sinuate at middle, the posterior margin finely beaded. The characters given above indicate a species allied to *salicola*, but at once distinguished by its color and by the much stronger craterform punctures.

Numerous specimens were taken by me on the flats adjoining Owen's Lake, California. They were commonest quite close to the water where the drift and wind had formed cakes of scum, composed chiefly of exuviae shed by the larvæ of flies. *T. inyo* might be seen running about, taking flight fairly readily if alarmed, but generally more abundant under the cakes than upon them.

T. salicola Lec.—Narrow, subdepressed, somewhat shining, rufotestaceous, more or less flavate, pygidium and usually the under side of the abdomen blackish. Elytra paler than the prothorax, crossed behind the middle by a piceous band. Pubescence rather sparse, that of the elytra directly longitudinally. Head subquadrate, basal impression distinct. Elytra leaving more or less of the pygidium exposed, minutely simply punctate in the female or with craterform punctures intermixed in the male; sides subparallel, apices subtruncate. Length 3 mm., a little more or less.

With the above I have united *tricolor* Casey, believing the name to have been applied to pale female specimens. I have not seen the LeConte types, which, however, were examined by Major Casey. The specimens of *salicola* from the Ulke collection, kindly loaned by Dr. Holland, are of the pale form.

As I interpret the species, it occurs at various points in the Great

Basin. The original description cites Great Salt Lake, but Mr. J. D. Putnam, who claims to have collected the specimens and to have sent them to Mr. Ulke, says (Proc. Davenport Acad. Sci., i, p. 201), that he took them on the shores of Utah Lake. I have since found it at the last-named point, in June; Clear Lake Station, Utah, common the first of July; Milford, Utah, one or two in July; Little Salt Lake, near Parowan, Utah, many under rubbish on the mud flats near the lake, in August; Humboldt Lake and Lovelock, Nevada, a few in June; and in great abundance under rubbish and caked mud along the beaches of Great Salt Lake, where it was also taken in numbers by Mr. Schwarz during June and July.

T. densus Casey.—Narrow, subdepressed, opaque, above rufotestaceous, darker than *salicola*, underside of meso- and metathorax and abdomen black. Pygidium black. Elytra with postmedian black band expanded on the sides and extending around the apex. Pubescence rather sparse. Head subquadrate, basal impression distinct. Elytra subparallel, tips subtruncate, exposing more or less of the pygidium, disk minutely finely densely punctate, with intermixed craterform punctures in both sexes, pubescence longitudinally directed. Length 3 mm., a little more or less.

My first inclination was in the direction of suppressing this name, the series of *salicola* showing some evident tendencies towards intergradation. On further consideration I have considered it unwise to do so, the typical specimens are so very different in appearance from *salicola* and readily separable at sight.

I have specimens, all of my collecting, from Saltair, Milford, Utah Lake, Sevier Lake, Clear Lake and Little Salt Lake, in Utah; and from Humboldt Lake, Nevada. It seems much less abundant than *salicola*, though associated with it.

T. infernalis n. sp.—Narrow, subdepressed, parallel, distinctly and (for this genus) strongly shining, yellowish testaceous, the head and prothorax slightly rufescent. Head subquadrate, truncate at base, median basal impression short, tempora subparallel, slightly arcuate and about as prominent as the eyes; surface reticulate and with shallow variolate punctures, separated on the vertex by spaces approximately equal to or slightly less than their own diameters. Antennæ with the eleventh joint equal to the ninth and tenth together, constriction deep, basal portion shorter. Prothorax narrower than the head, of much the usual form, but the sides in front of the middle are less bulging than in *salicola*, punctuation similar to that of the head but a little stronger and closer; collar and basal marginal line strong. Elytra dehiscent, broader than the prothorax, sides subparallel, apices subtruncate rounded, leaving the pygidium exposed; pubescence short, sparse, longitudinally disposed. Craterform punctures shal-

lower than usual, crowded near the base, separated by approximately their own diameters (though irregularly disposed) on the middle of the disk. Abdomen alutaceous, scarcely shining, sparsely punctured and pubescent. Legs moderate. Length 2.6 mm.

The measurement cited above, is that of the type, which belongs to the United States National Museum. Another specimen, which I have been allowed to retain, is slightly smaller, while a third, probable a female, is a trifle larger. This last mentioned specimen is somewhat differently colored, the elytra being slightly infusate at tip, and the entire upper surface of the body less shining. The abdomen in this last specimen is piceous, and it may perhaps not belong to the same species, since it differs also in not having evident craterform elytral punctures.

Collected in the Panamint Valley, California, by Mr. Koebele, during his connection with the Death Valley Expedition, and listed as *Tanarthrus* n. sp. by Mr. Linell in his report on the beetles of that region. The label bears date of April, 1891. The application of the specific name will be evident enough to one who has had experience in the district whence the species came.

T. alutaceus Lec.—Narrow, slightly convex, feebly shining, black, antennæ and legs more or less piceous. Pubescence fine, short and sparse. Elytra one-half longer than wide, with sparsely placed shallow craterform punctures among the fine interstitial ones. Length 2.2 mm.

Easily recognized by the small size, dark color and feeble sculpture. It is found in California, my specimens coming from Redondo (March and June) and San Diego County (March). They were given me by Mr. Fall.

BIBLIOGRAPHY.

- T. brevipennis* Casey, Ann. N. Y. Acad. Sci., viii, 1895, 751.
T. nubifer Casey, loc. cit., 752.
T. virginalis n. sp.
T. mormon n. sp.
T. inyo n. sp.
T. salicola LeConte, Trans. Am. Ent. Soc., v, 1875, 174 (*Tanarthrus*); Casey, Ann. N. Y. Acad. Sci., viii, 1895, 754; *tricolor* Casey, loc. cit., 753.
T. densus Casey, loc. cit., 754.
T. infernalis n. sp.
T. alutaceus LeConte, Ann. N. Y. Lyceum, v, 1851, 155 (*Anthicus*); Proc. Acad. Nat. Sci. Phil., vi, 1852, 104 (*Tanarthrus*); Casey, Ann. N. Y. Acad. Sci., viii, 1895, 755.